DEC STD 041-0 Customer Installability: Product Requirements

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ABSTRACT: This standard outlines policy and requirements for customer-installable systems, hardware, and software products. It defines responsibilities and requirements for communications, site preparation, shipping, delivery, unpacking, installing, and verification of a customer-installable product.

APPLICABILITY: This standard applies worldwide to all customer-installable systems, hardware, and software products, including servers, clients, and networking and telecommunications products and systems. It applies to such products throughout their life cycle. For products that are not customer-installable, this standard serves as a guideline to help achieve ease of installation.

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1 INTRODUCTION

The installation of certain products can be designed in accordance with this standard so that these products can be installed by members of the general public. These products can be designated customer-installable. The installation of some products requires installers with specialized training. Using this standard as a guideline may help achieve ease of installation for these products.

1.1 PURPOSE

The purpose of this standard is to define minimum requirements for the development of customer-installable systems, products, and installation processes worldwide. It also provides a uniform method of organizing, planning, and implementing the work associated with developing customer-installable products.

This standard continues to apply to customer-installable products after their release. Therefore, care must be taken to ensure that any changes to a product during its life-cycle do not compromise customer-installability features.

Individual organizations may add their own requirements to the minimum requirements defined in this standard.

1.2 SCOPE

This standard describes minimum product requirements and responsibilities for **all** customer-installable products sold by Digital, worldwide. Specifically included are:

- Customer-installable hardware and/or software products that customers purchase as new systems or components; for example, a new workstation with its associated peripherals and software, or a client server system and associated networking products
- Customer-installable upgrades to existing systems; for example, adding memory or installing a new software application on an already functioning system
- Any maintenance, diagnosis, service, or repair activities that customers are asked to perform as part of installing any product; for example, if an installation includes performing a system backup, replacing modules after diagnosing a failure, or installing toner cartridges in a laser printer, these activities must conform to this standard

This standard does **not** apply to:

- Business decisions about whether to develop and offer a product as customer-installable
- Aspects of products that do not involve any installation; for example, this standard does not cover general ease of use features, making complete fault diagnosis easy for customers to perform, or customizing already-installed software
- Products designed for installation only by people with specific training or skills; for example, a complex software unit requiring system management expertise. However, such products may use this standard as a guideline to help achieve ease of installation

It is not the purpose of this standard to provide an exhaustive list of the capabilities of customers. Instead, this standard specifies what must be true of the customer-installable products themselves so that customers can properly install them.

1.3 DEFINITIONS

A **customer-installable product** is one that has been designed and developed to permit a customer to receive shipment of a product, unpack it, install component pieces and software as necessary, and verify its operation; it satisfies the customer's expectations of product installation and operation. The installation instructions and process shall be simple enough that involvement by Digital is not needed during the entire process of installation and initial operation.

For purposes of this document, a **customer** is a member of the general public who installs a product. Customers are expected to possess the skills generally found among people who can install and operate simple electronic consumer products. Customers **shall not** be expected to have special skills or training.

A product that requires installation by a specially skilled or trained person shall not be designated customer-installable.

1.4 RESPONSIBILITIES

When a product is designed to be customer-installable, Product Management shall ensure that the Product Team has representation from the following functions.

- Product Management
- Engineering
- Human Factors
- Documentation
- Manufacturing
- Customer Services Systems Engineering (CSSE)

Responsibilities of these team members for ensuring the customer-installability of a product are listed in the remaining parts of this section. Section 2 outlines key activities during the Phase Review Process.

When appropriate, it is Product Management's responsibility to expand the Product Team to include additional functions when they are relevant to a project or business area. Additional functions important in the development of a customer-installable product may include:

- Internationalization
- Educational Services
- Marketing
- Legal
- Software Quality Management
- Industrial Design
- Graphic Design
- Industrial Packaging
- Product Safety

1.4.1 Product Management

The Product Manager, with support from other members of the Product Team, shall plan for customer installability from the product inception. The Product Manager has the final responsibility for ensuring that a customer-installable product meets the provisions of this standard and for deciding whether a product is offered as customer-installable.

The Product Manager shall gather product requirements related to customer installability for each country and market for which the product is intended.

Also, the Product Manager shall provide to Sales the information needed to adequately set customers' expectations concerning installation prior to and at the time of the sale.

Product Management shall follow *DEC STD 028-0 Phase Review Policy* during the design of a product intended to be customer-installable. Product Management's responsibilities are detailed in the *Corporate Phase Review Process Guide, EL-CP356-00*, and key steps in each phase are also described in Section 2 of this standard.

1.4.2 Engineering

Hardware and software engineers shall commit to all product design features requirements for customer installability in the appropriate requirements and specifications documents.

1.4.3 Human Factors

Human Factors is responsible for the technical content of this standard, and for advising the product development team of customer-installability issues and design features. At the request of Product Management, Human Factors may also be responsible for conducting testing to ensure that customer-installable products meet this standard. In some cases, Human Factors may advise others on how to conduct customer-installation testing.

1.4.4 Documentation Group

The documentation group is responsible for developing documentation to guide customers through the installation of their customer-installable product. The documentation group is also responsible for ensuring draft copies of the documentation are available for customer installation testing. See Section 6 for detailed installation documentation requirements.

1.4.5 Manufacturing

Manufacturing is responsible for ensuring that the features essential for customer installability, as specified by Engineering, are present in the product when it arrives at the customer site. They also must ensure that any changes to the product in Phase 4 do not compromise the product's customer installability. This includes notifying the appropriate documentation group so that customer information can be updated in a timely and accurate manner.

1.4.6 Customer Services Systems Engineering (CSSE)

CSSE is responsible for advising the product development team of customer-installability issues and design features, product warranties, service strategies, support offerings, and maintenance practices related to product installation. CSSE is also responsible for assessing the impact of customer installability features related to maintenance and support of the product.

1.5 WAIVERS

If it is necessary that a product or system deviate from the requirements of this standard, a waiver must be obtained in accordance with *DEC STD 066-2 Waivers to Digital Design Standards*.

1.6 DOCUMENT STRUCTURE

- Section 1, *Introduction*, describes the purpose, definitions, and scope of this standard, and the process for waivers. It also lists the responsibilities of Product Team members during the development of customer-installable products.
- Section 2, *Phase Development Overview*, describes the key steps in the development of a customer-installable product.
- Section 3, *System Requirements*, describes the importance of taking a systems approach to customer installability and contains customer-installability requirements for systems. Subsections discuss product naming, presale customer communications, installing, verification, installation information, and multi-vendor systems.
- Section 4, *Hardware Requirements*, contains requirements for customer-installable hardware components and products. Subsections discuss presale customer communications; packing, shipping, and delivery; unpacking; installing; verification and troubleshooting; and product safety.
- Section 5, *Software Requirements*, contains requirements for customer-installable software components and products. Subsections discuss presale customer communications; packing, shipping, and delivery; installing; license management; configuration and system management; upgrade; and verification.
- Section 6, *Installation Documentation Requirements*, contains requirements for the documentation that supports the installation of a customer-installable product or system. Included are subsections on planning, site preparation, system overview, and installation.
- Section 7, *Determining the Customer Installability of a Product*, outlines the purpose and methods of conducting customer-installability testing.
- Appendix A, *Referenced Documents*, lists associated documents that are mentioned in the standard, along with information on how to obtain these documents.

2 PHASE DEVELOPMENT OVERVIEW

The following information describes the key steps in the development of a customer-installable product.

During Phase 0:

- Customer installability recommendations and requirements are established. These include, but are not limited to:
  - — Product features necessary to ensure customer installability
  - — Packaging and distribution schemes for all system components
  - — Internationalization and regulatory requirements
  - — Consistency and compatibility with prerequisite and associated products
- Customer installability requirements are included in the:
  - — *Marketing Requirements* document
  - — *Product Requirements* document
  - — *Customer Services Impact and Requirements* document

During Phase 1:

- The product requirements for customer installability are translated into product attributes and included in the *Engineering Functional Specification*.
- The documentation requirements to support customer installation are identified and included as part of the *Documentation Plan*.
- Customer-installability is included in the product's POM plan, defined in *DEC STD 072-0 Corporate POM (Point of Manufacture) Qualification Criteria*
- Customer-installability activities are started as part of product development.
- Criteria are established for demonstrating that a product meets its customer-installability requirements.

During Phase 2:

- Hardware prototypes, software base levels, installation verification tests, and draft documentation are developed and tested for customer installability.
- Customer-installability projects continue.

During Phase 3:

- Installation and system documentation are completed.
- Final tests of the customer-installable product with options (if any) are conducted.
- Problems with customer installations are monitored and tracked.
- Corrections are made to installation procedures and documentation, to ensure compliance with this standard.

During Phase 4:

- Any changes to hardware, software, documentation, or installation verification procedures are evaluated with respect to their impact on customer installability.

- An evaluation is performed as part of the post-project review to assess whether the goals for customer installation are being met.

For further details concerning all phases of product development, refer to *DEC STD 028-0 Phase Review Policy*, and the *Corporate Phase Review Process Guide, EL-CP356-00*.

3 SYSTEM REQUIREMENTS

Customer-installable products shall be developed to ensure that all interacting subsystems and components, including (but not limited to) hardware, software, packaging, documentation, and paperwork, shall form a system that the customer perceives as well-organized and integrated. A customer-installable system is generally NOT obtained by simply combining a set of customer-installable components.

For some products, the goal is for all components that comprise a total system to be customer-installable as a complete system; for example, a networked workstation with its peripherals, operating system, and applications software. For other products, the goal is for only certain components to be customer-installable; for example, a particular software application, assuming that the hardware and operating system are already installed.

For all customer-installable products, it is important to take a systems approach by considering the larger system context at the customer's site and designing all components to interact smoothly with each other and within the customer context.

Sections 4 through 6 of this standard define customer-installability requirements for hardware, software, and documentation components, including ways for the individual components to be integrated as part of a total system. The remainder of this section outlines additional requirements that must be coordinated across components to help achieve customer installability within a systems context.

3.1 SYSTEM AND PRODUCT NAMES

The naming of a product, product set, or packaged system shall be done in such a way that customers can easily identify the components that are part of the system they ordered. The name(s) under which the system is marketed and sold shall be clearly and appropriately present in the labeling of the product and in the product descriptions that appear on the shipping paperwork and containers.

For example, if a packaged system is called System A when marketed, "System A" must appear in prominent locations on the product when it arrives at the customer site so that customers recognize it as the system they ordered. Examples of appropriate locations for "System A" might include the product medallion, the title of the system manual, and the product description. It is inappropriate for System A to bear only the names of its individual components.

All references to equipment, components, software, systems, and so forth, should be consistent throughout the installation process. For example, an option should be marketed, ordered, labeled, referred to in installation documentation, and referred to in software installation using a consistent name.

3.2 SYSTEM PRESALE CUSTOMER COMMUNICATIONS

Customers worldwide shall be informed clearly which components of a total system are customer-installable. For additional information on presale customer communication, see Sections 4.1 and 5.1.

3.3 INSTALLING SYSTEMS

The installation process shall be designed to smoothly incorporate all components of a total system as easily as possible. For example, software installation procedures shall contain the necessary tools, entry points, and style information so that developers of layered products and applications can develop installation procedures for their products that fit smoothly into the total system. Care must be taken to ensure that the operation of the system as a whole is not put at risk when physical attachments are made or when software parameters are defined. See Sections 4.4, 5.3, and 5.4 for further information on installing and ensuring straightforward system configuration.

3.4 SYSTEM VERIFICATION

Verification procedures shall indicate that the major components of the system work together correctly. For example, client-server products should include a verification procedure that indicates that all products are working together, including the server, all installed clients, and all logical connections to other servers (such as distributed print queues). For more information on verification, see Sections 4.5 and 5.7.

3.5 SYSTEM INSTALLATION INFORMATION

Installation information shall also use a systems approach. An overview of the steps of the system installation shall be provided, so the customer understands how the installations of the individual components interrelate. Depending on the product, the overview can range from a simple checklist to a comprehensive manual incorporating software, hardware, and other information. For additional information on installation documentation, see Section 6.

3.6 MULTI-VENDOR SYSTEMS

When non Digital components are sold by Digital as part of a customer-installable system, those components shall adhere to the provisions of this standard. Digital customer-installable systems shall not preclude incorporation of non Digital products into the system. Instead, when possible, appropriate methods shall be provided for customers to include Digital and typical non Digital components together in the same system.

4 HARDWARE REQUIREMENTS

4.1 PRESALE CUSTOMER COMMUNICATIONS

Product management shall provide to Sales the information needed to adequately set customers' expectations concerning installation prior to and at the time of the sale. This information should be included in appropriate sales literature. Customers worldwide shall be informed clearly to know the following:

- Systems that are customer-installable
- All prerequisite products, revision levels, minimum capacities of required hardware and software products, any other required functionality, and required documentation
- Additional media and supplies that may be required
- Site preparation
- Number of people required to perform the installation

- Time required for the installation
- Available warranty terms, the start date, and duration of the warranty
- Available maintenance agreement terms and any routine maintenance the customer is expected to perform
- Optional customer services, such as consulting and training, and how to purchase them
- Options available to customers in various locations if the installation is unsuccessful
- Languages in which information on the following topics is available: site preparation, installation, diagnostic messages, and labels (Note that products cannot be considered customer installable without accompanying installation documentation in a language acceptable to the customer.)

Sales shall provide the customer with product-specific site preparation information at the time of the sale. For further information on the contents of site preparation information, see Section 6, Installation Documentation. If required, Sales shall also notify the appropriate local service organization of the sale.

4.2 PACKING, SHIPPING, AND DELIVERY

Customer-installable hardware, options, and documentation shall arrive together. Software media and related documentation shall arrive at the same time as the hardware. Items should be grouped in shipping containers according to their use in the final system. All portions of an order shall be at compatible revision levels (documentation, hardware, and software).

Each box shall be of manageable size and weight for the number of people required to handle and move it (see *DEC STD 105-0 Display Workstation Ergonomics*). Warnings relative to handling shall be clearly identified, and appropriate international packaging symbols shall appear on the boxes (see *DEC STD 178-5 Marking Symbology*).

Shipping paperwork shall conform to *DEC STD 178-8 Digital Identification Marking Requirements—General Shipping Documentation and Container Labeling Requirements for Finished Goods Intended to be Shipped to Customers*. There shall be a clear Content Listing with each container enabling the customer to identify each part and ensure it is present in the shipment.

4.3 UNPACKING

Unpacking a customer-installable product shall be safe, easy, and straightforward. Shipping container markings must be consistent with corporate graphic requirements set forth in *DEC STD 178-4 Shipping Container Marking Requirements for Finished Goods*. Pictorial unpacking instructions are required on the outside of a shipping container under the following circumstances.

- When there is risk of injury to the unpacker or damage to the product
- When unpacking requires two or more people, such as when the product weighs more than 13.6 kg (30 pounds) (the maximum recommended weight for one person to lift, as defined by DEC STD 105-0)

- When unpacking is more complex or confusing than simply opening the box from the top and lifting out the contents (examples of more complex procedures are cutting straps, attaching ramps, or tipping the package on its side to remove the product)

If required, instructions shall be included that explain how to store packing material. If storage is indicated, packing material shall be easy to store, safe, and consume minimal space. (Some flammable packing materials can be stored only in specially-constructed areas.)

Repacking instructions shall be included for products that must be returned to the factory for servicing or exchange.

4.4 INSTALLING

Customer-installable hardware shall be designed so that all actions required of the installer are simple and straightforward:

- Customers should not be required to access the internals of a system. The factory should install all internal options that are ordered with a system. If customers are expected to access the internals of systems, or install internal options to upgrade a system, the system must be reviewed and approved by Product Safety. See Section 4.6, Product Safety.
- The internal assemblies, connection points, and mounting points for the installation of options shall be easy to identify. Part numbers shall be clearly visible on modules and major assemblies and shall be clearly detailed in the installation information.
- All cables, terminators, and connectors shall be labeled uniquely. The goal is for every cable to fit into only one correct connector in only one orientation.
- The appropriate power line cord set shall be provided for the location of the installation.
- Loose pieces shall be kept to a minimum during the installation. For example, whenever possible, any screws that must be loosened should be captive screws.
- Individual installers shall not be required to lift more than 13.6 kg (30 pounds) (See DEC STD 105-0). They shall not be asked to perform any actions which might cause injury to the installer or damage to the product.
- Specific static protection of the equipment should not be required during customer installation. If static protection is required, its proper use shall be as simple and unencumbering as possible. Any required static protection devices shall be provided with the equipment, and procedures for their use shall be clearly documented.
- The goal is to not require tools for installation. If tools are required, they shall be kept to a minimum, shall include only simple tools such as a screwdriver, and shall be shipped with the product.
- The number of physical switches should be kept to a minimum.
- All switches, indicators, latches, doors, and so on, that are used during customer installation shall be simple to understand and to operate. They shall be labeled adequately and documented for the user. (See DEC STD 105-0.)

- If a system order consists of hardware and associated software, the goal is for the software to be preinstalled by Digital at the factory. Completion of the installation shall only require customers to perform an installation verification procedure and any customization necessary for their particular use.
- The goal is to have no separate test or loopback connectors required for installation verification testing. If such connectors are required, they shall be included with the product.

Customers shall be informed how to obtain installation assistance in the event that they have difficulty or something goes wrong during the installation. A feedback mechanism designed for customer input (for example, a hotline or a survey card) shall be available for all countries in which the product is designated as customer-installable.

For installation documentation requirements, see Section 6.

4.5 VERIFICATION AND TROUBLESHOOTING

A verification process shall be available to customers to demonstrate that the product has been installed properly and that all components are working. The following list describes increasingly stringent levels of verification which could be included as part of a hardware installation verification procedure.

a. Power up the system and observe test status

b. Run hardware diagnostics

c. Boot the operating system, enable error logging, run the system exercisers, and check for entries in the error log

Troubleshooting procedures shall also be included to help customers recover from possible problems during installation.

Verification and troubleshooting procedures shall be safe and easy for the customer to perform. They shall be clearly documented and require no intervention by Digital.

The output of verification and troubleshooting shall include failure or success status and shall clearly state any problems encountered. If a problem or failure occurs, diagnostic error messages and user documentation shall clearly identify possible corrective actions. Customers shall also be directed to their warranty information for instructions on obtaining additional help or service, if necessary. Note that these services are not the same worldwide. See *ELSM498-00, Producing International Products*.

4.6 PRODUCT SAFETY

The customer shall not be exposed to any dangerous voltages, energy, mechanical, or chemical hazards during installation or verification (see *DEC STD 119-0 Digital Product Safety*). Specific warnings may be required in the installation documentation or the labels for some products.

Neither the customer nor the system shall be exposed to unreasonable danger due to errors or mishandling during installation or verification. During the design of a customer-installable hardware product, distinctions are made between operator access areas and service access areas. Care shall be taken to ensure that customers are not

directed into service access areas. Such direction may well be proscribed by applicable product safety standards and/or state and/or national laws and regulations.

The customer installation process shall be included in the product safety review process to ensure that the installation does not violate safety standards and safety agency approvals. The Product Safety Engineer must be involved whenever there is doubt about the safety of installation procedures. The Product Safety Engineer will consider the applicable safety standards and the requirements of national and international regulatory agencies.

5 SOFTWARE REQUIREMENTS

5.1 PRESALE CUSTOMER COMMUNICATIONS

Product management shall provide to Sales the information needed to adequately set customers' expectations concerning installation prior to and at the time of the sale. This information should be included in appropriate Sales literature. Documents such as the Software Product Description (SPD) and the System Support Addendum (SSA) shall include clear statements so that customers worldwide know:

- Systems that are customer-installable
- All prerequisite products, revision levels, minimum capacities of required hardware and software products, any other required functionality, and required documentation
- Additional media and supplies that may be required
- Expected installation time, including all activities prior to initial operation
- Different software support categories
- Available warranty terms, the start date, and duration of the warranty
- Available maintenance agreement terms and any routine maintenance the customer is expected to perform
- Optional customer services, such as consulting and training, and how to purchase them
- Options available to customers in various locations if the installation is unsuccessful
- Languages in which information supporting the installation is available both in manuals and on the screen: site preparation, installation, diagnostic messages, and labels (Note that products cannot be considered customer installable without accompanying installation documentation in a language acceptable to the customer.)

5.2 PACKING, SHIPPING, AND DELIVERY

The goal is to have all parts of the order that belong together in the final system arrive at the customer site at the same time. For example, all software shall ship with the manuals that describe the installation and use of that software. Software and related documentation shall arrive at the same time as the hardware. Customer-installable, layered product software shall arrive with or prior to the operating system shipment. All information a customer needs for the installation (for example, Cover Letter, Release Notes, Installation Manual, Product Authorization Key) shall be grouped together in a logical sequence and shall be easy for the customer to locate and recognize.

All portions of an order shall be at compatible revision levels (documentation, hardware, software).

Wherever possible, customers should not be required to assemble manuals. For example, pages should be on rings and spine inserts should be in place prior to shipping. If this is not feasible, the amount of work customers must perform to assemble their manuals should be minimized; for example, by shrink-wrapping together the manuals and their binder, or by using an alternative binding style such as Wire-O or perfect binding.

Shipping paperwork shall conform to DEC STD 178-8. There shall be a clear, customer-understandable Content Listing with each container.

Each box shall be of manageable size and weight for the number of people required to handle it. (See DEC STD 105-0.)

5.3 INSTALLING

Customer-installable software shall involve a minimum of customer interaction during installation. This minimum interaction may occur in one of two general ways:

- The software may be preinstalled at the factory, with customers only required to follow simple step-by-step instructions in customizing the product to the requirements of their particular usage. Preinstalled software is the goal for a customer-installable system which consists of software and hardware ordered together.
- The software installation may follow a set of simple, step-by-step procedures which guide the customer from beginning to end. This applies to software upgrades, layered products, and other situations in which preinstalled software is inappropriate.

In either case, all involvement by a customer between the time the installation begins and the time the installation verification procedure is completed must meet the requirements stated in this standard.

Installations must have a minimal impact on the remainder of an enterprise's operations. For example, software installation should avoid the need to reboot a system, or it should have the ability to postpone the reboot to minimize user impact.

The customer shall be strongly advised to ensure any software and data already on the system are backed up prior to beginning the installation.

The customer shall be provided with an estimate of the time the installation will require. The installation process shall have a well-defined beginning and end. This process shall contain concise steps, each with a well-defined beginning and end, including step-by-step verification. For information on installation documentation, see Section 6.

Customers shall be informed how to obtain installation assistance in the event that they have difficulty or something goes wrong during the installation. A feedback mechanism designed for customer input (for example, a hotline or survey card) shall be available for all countries in which the product is designated as customer-installable.

5.3.1 Installation Dialog

When customers need to supply any specific input as part of installing software, the following shall be done.

- The installer shall be informed what information to gather prior to starting the installation. For example, the installer shall be provided with a worksheet for recording the required information.
- Customer input shall be kept to a minimum. Customers shall only be requested to supply information that the system cannot reasonably determine itself.
- Customer input shall be requested in the form of simple questions or menu choices, with default values, permissible answers, and example answers in the correct syntax clearly presented as part of the question. A brief explanation of the implications of each input item shall be provided.

- All customer input shall be requested and checked for validity at the beginning of the installation. When all questions have been asked and answers verified, the system shall indicate so by issuing a message similar to, "There will be no further questions." Customers shall not be requested for input sporadically throughout the installation.
- Customers should be informed of the approximate time remaining for the installation. The time should be the estimate of the time required for the specific installation, or the time should be given as a range.
- Error messages shall clearly state the reason the error occurred and, if possible, how to correct the problem, either on line or in the installation documentation. They should not use language likely to confuse the installer, such as *Insufficient PGFLQUO*. Error messages shall not require any remedial action beyond the technical capabilities of the installer. Messages shall not direct the installer to attempt tasks that might require special knowledge.
- The installer shall be provided a simple way to correct any input. In addition to allowing for corrections as each question is asked, the system should present a summary of inputs with another chance to make corrections after all the questions have been asked.
- The installer's inputs shall be saved for possible re-use at the time of an upgrade (see section 5.6.). This applies both to configuration information and installation information.
- The installation dialog and documentation together shall be considered as parts of the user information set. Care shall be taken to ensure that the product names and other terms are used consistently throughout the user information set (see section 3.1). In addition, dialog shall be written for an international audience and designed with translation in mind. (See *Producing International Products*.)

After all customer input is received and verified, the installation procedure should automatically check all system requirements before beginning to move files to the target destination. The installation should proceed without further customer intervention. Periodic feedback about what is occurring in the installation should be provided on the screen. In addition, a log file including all installer input and system responses throughout the installation procedure shall be created by default and remain on the system. A hard copy output device shall not be required for installation.

5.3.2 Installation Capabilities

The customer shall be able to perform the following procedures, with the ability to stop and resume between procedures.

1. Base system installation
2. Base system verification
3. Optional software or layered product installation
4. Optional software or layered product verification

Break points may sometimes be called for during long installations. The design of the installation procedure may allow the installer the opportunity to suspend the installation for any reason, and then resume. Following unexpected interruptions, installation should be resumed instead of requiring installers to repeat the installation from the beginning. A

deinstallation procedure shall be provided that allows the customer to completely remove all components installed by this installation procedure. The deinstallation procedure should work correctly regardless of the point at which the installation procedure is terminated. See section 5.7 for information about installation verification.

Manual installation of updates and autopatching procedures shall be eliminated whenever possible by remastering the distribution media. When remastering is not possible, patch installation procedures shall occur automatically without user intervention.

5.4 SOFTWARE LICENSE MANAGEMENT

For a product to be considered customer-installable, any procedure required to properly register the software license must be part of the total installation process. License management shall be made as easy and straightforward as the other aspects of software installation discussed in this standard.

5.5 CONFIGURATION AND SYSTEM MANAGEMENT

The installation software shall be constructed to make configuration and system management as straightforward as possible. Whenever possible, the installation software shall:

- Allow the customer to set the appropriate local language.
- Initially, guarantee the minimum system resources (hardware and software) to perform the installation (If sufficient resources are not found, the installation procedure should stop and clearly indicate the reason to the installer).
- The products themselves must verify any product dependencies are satisfied before file manipulation begins; for example, existence, operation, or revision levels
- For operating system installations, request the user to enter the correct system date and time in the appropriate local format. (Do not assume that the system clock is correct.)
- Provide for system security by not creating any accounts with default passwords and by verifying correct file protection.
- Install and configure any layered applications that were purchased as part of the system.
- Include installation of any computer-aided instruction or help tools that are part of the system.
- Include a clear troubleshooting strategy for both the customer and for Digital. (This may include hotline support, error log files visible to Digital support personnel, remote diagnostic tools, and so on.)
- Lay the foundation for (and minimize the complexity of) later system management functions. For example, set up template user accounts; if a print queue is necessary, create it as part of the installation; make it easy to network, to perform backups, and to add new hardware devices, new users, and new applications. Where possible, any information required by the product for normal operation should be gathered automatically, instead of requiring the customer to gather and/or enter it manually.

- Include the necessary tools, entry points, and style information so that developers of layered products and applications can develop installation procedures for their products that fit into the total system. (Ideally, installation of layered products and applications should use the same general sequence and should share the same "look and feel" as the installation of the system software.)

5.6 UPGRADE

If the installation of an upgrade to an existing system is customer-installable, it must conform to all the requirements in this standard. In addition, the upgrade must:

- Take into account the current user and software environment and perform the minimum changes necessary to install the upgrade. Customers should be given the option of using answers from the previous installation or performing a new installation. As much as possible, questions which were answered as part of the original installation should not be asked again.
- Warn installers of consequences such as overwriting files, purging files, or converting files to a new format.
- Preserve all user data. If data conversions are required, an estimated time for the conversion or process shall be provided, and the installer shall be given the option to perform the conversion immediately or defer the conversion to a later time. When data conversion is performed, the old data shall be preserved in the old format in the event that the upgrade must be rolled out. It may be acceptable to give the customer the option of deleting the data if it has been backed up. However, the default should always be to preserve the old data in the old format.

5.7 VERIFICATION

There shall be a clearly-documented verification process available to customers that demonstrates that the product is installed and functions properly. All functions, including all modules with a user interface, shall be certified as working. In addition, in a network environment, client and server dependencies must be exercised and verified to function properly. The customer shall be provided with an estimate of the time the verification will require. Examples of verification procedures are:

- Using an Installation Verification Procedure (IVP) based on IVP utilities provided by the system (The IVP should be run from an end user account, and it should remain on the system and be available for use independent of installation.)
- Verifying the location, size, checksum, and so on, of each file
- Putting the system into a demonstration or operating mode and instructing the user to verify operation of each major component of the system

In rare cases, an IVP may not be practical. In such cases, a clearly documented sequence of steps shall be provided to verify that the software functions properly.

The completion of the verification procedure must be the clearly-defined endpoint of all successful installations. Unsuccessful installations must reach a clearly defined endpoint, such as an error message that indicates the exact nature of the problem that the installation encountered and what remedial actions should be taken (see section 5.3.2).

A hard-copy output device shall not be required for verification, but a complete log file of the verification shall be created by default and left on the system.

If required, a warranty registration procedure shall be provided.

6 INSTALLATION DOCUMENTATION REQUIREMENTS

Installation documentation is defined as all information provided to the customer that supports the successful installation of the system, software, and/or hardware product. It is assumed that all installation documentation conforms to the applicable Digital style and process guidelines.

Installation documentation supports the installation process, and should address the entire system installation, including all hardware and software, from arrival of boxes through system verification. Any activities that must be completed prior to the installation must be clearly specified. The installation process shall have a well-defined beginning and end. Within this process, concise steps shall be provided, each of which has a well-defined beginning and end, including step-by-step verification when applicable. The customer shall be provided with estimates of the time needed for the installation of the hardware and software.

The goal is for all installation-related information to be coordinated, use consistent terms, and form one organized set. The majority of the information needed for customer installation is typically contained in site preparation and installation manuals. Whenever possible, installation information should not be split across multiple documents. When it is not practical to put installation instructions for separate components into the same manual, the total system installation shall follow a clear sequence of simple steps. Clear cross-references shall be provided between installation manuals. In addition, many other items may contain information related to installation. The following items are not specifically covered in this section, but contain information that should be coordinated with the rest of the installation documentation.

- Installation Checklist
- Customer Letter
- Cover Letter
- Release Notes
- Warranty
- License PAK (Product Authorization Key)
- Software Product Description (SPD) and Systems Software Addendum (SSA)
- Content Listing, Product Delivery Document, Bills of Material
- Information that may appear on the screen, such as an installation dialog, error or help messages, or troubleshooting information

Typically, hard-copy installation documentation is required. However, for some hardware and software products, it may be practical to consider additional forms of installation information delivery, such as computer-based instruction, video-based instruction, and various forms of on-line documentation. These additional forms of installation information are not intended to replace traditional hard-copy installation documentation.

6.1 DOCUMENTATION PLANNING

The *Documentation Plan* is a key component of the product planning process. The plan is required to close Phase 1 of the Phase Review process. Although the format and content of the *Documentation Plan* may vary across publications groups, certain basic elements should be present to ensure that customer-installability requirements are met, including:

- Design of the documentation set. Outlines of the manuals in the set shall include those manuals specifically applicable to hardware and software installation, and shall specify how the manuals interrelate to facilitate installation. For a system installation, an overview of the complete system installation shall be provided.
- Statement of compliance with internationalization requirements for documentation. Internationalization standards and guidelines shall be followed during the planning, writing, and testing of product documentation. Note that for customer-installable products, all installation and safety information must be in a language acceptable to the customer. A complete set of guidelines is available in the publication, *Producing International Products*.
- Statements of compliance with various Digital standards, templates, and guidelines. These standards, templates, and guidelines ensure consistency and clarity across a broad range of documentation products. Their use should be managed through the *Documentation Plan*.
- Review list containing the names of key technical reviewers and interested parties. It is the responsibility of these reviewers to ensure that the documentation supplied fulfills the needs of the customer and accurately reflects the product.
- Schedule and plan for testing. Testing for customer installability and usability should be incorporated into the development of all customer-installable products. Documentation groups shall support this testing by providing appropriate draft copies of relevant installation information.

6.2 HARDWARE SITE PREPARATION INFORMATION

Proper site planning is a key ingredient to the successful installation of any product, particularly hardware. A customer who is responsible for preparing a site for a customer-installable product shall receive a site preparation guide prior to receiving a shipment, and well in advance of planned installation. The site preparation guide shall also be included in the product shipment.

The site preparation information shall include, but not be limited to:

- Product size and weight, both packaged and unpackaged
- Floor space requirements, including additional area to allow operation and service
- Air conditioning, power, and environmental requirements
- Physical storage requirements for accessories, supplies, and so forth

The site preparation guide shall include potential risks associated with improper site preparation and maintenance. It shall also include outside services that might be required, such as telecommunications and network services, air conditioning, special electrical service, or power conditioning. Any tools supplied or required for site preparation, unpacking, and assembly shall also be described in the site preparation guide. The guide shall be brief and well illustrated, with simple straightforward text. *DEC STD*

003-0 Hardware Documentation Standard provides detailed minimum requirements for Site Preparation Guides. In some cases, a generic Site Preparation Guide such as *Site Environmental Preparation Guide, EK-CSEPG-MA-001*, may be appropriate.

6.3 SYSTEM INSTALLATION OVERVIEW

For customer-installable systems, an overview of the system installation shall be provided, so that the customer knows how the installation of any individual components interrelate. The goal of the System Installation Overview shall be to clarify the installation steps and interconnections among likely Digital and non Digital system components. This overview shall cover, at minimum, the components of the system likely to be sold as part of the same system order. The overview shall clearly state the name of the system.

6.4 HARDWARE INSTALLATION INFORMATION

Installation instructions for customer-installable hardware products shall contain clear directions with an emphasis on action-oriented illustrations, supported by simple to understand text. Particular attention shall be paid to internationalization, minimizing and clarifying any required cross references, and creating good illustrations and examples. DEC STD 003-0 contains a detailed list of information to consider for inclusion in hardware installation documentation.

6.5 SOFTWARE INSTALLATION INFORMATION

Installation instructions for customer-installable software products shall contain clear directions, coordinated with on-screen installation dialog (see section 5). Particular attention shall be paid to internationalization, minimizing and clarifying any required cross references, and creating good examples. Where appropriate, the following information shall be included.

- How to prepare for the installation
  - — System hardware and software prerequisites, or a clear reference to the location of that information in the SPD
  - — Hardware, other software, client, server, or telecommunications resources required to perform the installation and effectively use the software after installation
  - — How to store, handle, and, when appropriate, initialize media
  - — How to set characteristics such as terminal characteristics, character sets, and language keyboard mappings, if necessary
- How to perform the installation
  - — Node names, addresses, and other system information that may be needed
  - — Privileges, passwords, and other security features are needed from all members of the system, including any network requirements
  - — Examples of the installation dialog, including a sample of a complete successful installation and verification session
  - — Understandable explanations of all messages, such as error messages and informational messages, that may be issued
  - — Clear instructions for recovering from problems

- What information is needed after installation
  - — How to verify the installation
  - — Space occupied by the system, and directory and/or partition sizes following installation
  - — Final location of files
  - — List of logicals and environment variables
  - — Support for initial configuration and system management as appropriate (see section 5.5)

7 DETERMINING THE CUSTOMER INSTALLABILITY OF A PRODUCT

The Product Team shall plan for customer installability from the inception of the product and work throughout its development to ensure that the provisions of this standard are met. However, compliance with the product requirements in this standard does not guarantee customer installability; it is possible for a product to meet all the product requirements and still be difficult for customers to install. Therefore, the normal procedure is for the Product Team to set measurable installability goals and repeatedly test and improve a product's installation until it is demonstrated to be customer installable.

7.1 CUSTOMER-INSTALLABILITY GOALS AND METRICS

No single set of metrics applies appropriately to all customer-installable Digital products. A goal of 30 minutes to install one product may be inappropriately long or short for another product or another market. Therefore, each Product Team should set goals for installability which will meet the needs and expectations of their customers.

The following list suggests metrics which Product Teams may want to use in setting goals for customer installability:

- Mean time to install (whole systems or major steps in the installation process)
- Percent of installations which are completed within a set time limit
- Number of problem-free installations
- Number of times installers need assistance during the installation
- Installer's rating of the ease or difficulty of installing the product

7.2 CUSTOMER-INSTALLABILITY TESTING

Customer-installability testing (or "Day One" testing) begins the process of determining whether the specific customer-installability goals for a product have been met. The recommended procedure involves asking test participants to perform a complete, realistic installation of the complete system or set of products being tested, just as if they were customers receiving the product. Testing may be conducted with draft manuals and reasonably representative hardware and software. Care must be taken to ensure that participants are recruited and treated ethically and that the observations and recommendations are as unbiased as possible. Appropriate participants are people who have no special skills or training and who have no direct involvement in the development of the product.

Feedback from at least three to six customer-installability test sessions should be used to improve the system installability. The cycle of testing and improving should be repeated until no major installation problems are observed. The Product Manager, with advice from the Product Team, determines whether the product can be easily installed by customers, as defined in this standard, and whether the product meets its goals for customer installability. The Product Manager has the final responsibility for deciding whether the product will be offered as customer-installable.

Customer-installability testing is typically conducted by Human Factors during Phase 2. In some cases, Human Factors may advise others on how to conduct customer-installability testing. Also, other groups may conduct tests that include testing for conformance to some aspects of this standard. For example:

- Customer-installability testing may be continued as part of field test.
- Documentation groups may test the usability of all or portions of their information sets.
- In the case of local-language variants, local engineering groups or other groups capable of testing in the appropriate language may conduct installability tests.
- CSSE may include additional installability testing as part of their *Serviceability /Maintainability Test Plan*.
- Product safety testing and review, specifically relating to customer installation or upgrade and associated documentation, may be required.

If customer-installability testing is not completed during Phase 2, it may be continued and completed during Phase 3 of the product development cycle. During Phase 4, an evaluation of currently shipping products should be performed to assess whether the product's customer-installability goals are being met.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00003-00	*DEC STD 003-0 Hardware Documentation Standard*
EL-00028-00	*DEC STD 028-0 Phase Review Policy*
EL-00066-02	*DEC STD 066-2 Waivers to Digital Design Standards*
EL-00072-00	*DEC STD 072-0 Corporate POM (Point of Manufacture) Qualification Requirements*
EL-00105-00	*DEC STD 105-0 Display Workstation Ergonomics (Human Factors): Design Criteria*
EL-00119-00	*DEC STD 119-0 Digital Product Safety - Introduction and General Requirements*
EL-00178-04	*DEC STD 178-4 Shipping Container Marking Requirements for Finished Goods*
EL-00178-05	*DEC STD 178-5 Marking Symbology*
EL-00178-08	*DEC STD 178-8 General Shipping Documentation and Container Labeling Requirements for Finished Goods Intended to be Shipped to Customers*
EL-SM498-00	*Producing International Products Reference Set*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

A.2 Other Digital Documents

Document Number	Document Title
EK-CSEPG-MA-001	*Site Environmental Preparation Guide*
EL-CP356-00	*Corporate Phase Review Process Guide*

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